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ABSTRACT

The report of the National Longitudinal Transition Study presents initial findings on individual characteristics which relate to postsecondary education participation since 1985-86 among more than 8,000 youth (ages 13 to 23) with disabilities. A series of logistic regression models examines such factors as youth's background characteristics, abilities and disabilities, students' secondary school achievement and behavior, and community characteristics. The first section briefly describes the postsecondary education participation rates of youth with disabilities. Next, the methods used in the multivariate analyses and the findings from these analyses are presented. The final section discusses the policy implications of the findings. Overall, 15% of youth with disabilities who exited secondary school participated in postsecondary education during the year prior to the interview. Youths with visual or hearing impairments had the highest rates of participation while youths with multiple handicaps or mental retardation had the lowest rates of participation. Background characteristics related to participation included head of household's educational level IQ, graduation from high school, participation in groups, and length of time since high school. Individual characteristics were associated with participation in two-year and four-year institutions but not to participation in vocational institutions. Tables provide detailed statistical data and the appendix gives an overview of the study. (DB)

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MAKING THE TRANSITION: AN EXPLANATORY MODEL OF SPECIAL EDUCATION STUDENTS' PARTICIPATION IN POSTSECONDARY EDUCATION

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MAKING THE TRANSITION: AN EXPLANATORY MODEL OF SPECIAL EDUCATION STUDENTS' PARTICIPATION IN POSTSECONDARY EDUCATION

Youth with disabilities enroll in college or in postsecondary vocational programs for many of the same reasons that youth without disabilities do: to further their education, to improve their vocational skills and their chances of getting a job, to obtain a degree or certificate, or to fulfill their own or their parents' expectations (Becker, 1975; Thurow, 1975; Spence, 1974; Feldman and Newcomb, 1969). In addition, for some youth with disabilities, postsecondary institutions may provide transition services that are an extension of the education or training received in high school, such as vocational courses, or access to general support services, such as assistance with career decision-making via job placement centers or counselors in community colleges.

Until recently, there has been little systematic data on the participation of students with disabilities in postsecondary education (Willingham, 1987). Consequently, federal education policy and programs to facilitate the transition of youth with disabilities from high school to adult life have not emphasized the role of postsecondary education institutions in preparing students with disabilities for the world of work (Will, 1984), despite the apparent economic benefits of collegiate education and postsecondary vocational programs (Rumberger and Daymont, 1984; Flynn, 1981 and 1982).

With the passage of PL 98-199, Amendments to the Education for the Handicapped Act (EHA) in 1983, federal special education policy gave increased attention to secondary school education services and to the transition of high school students to adult life. Further amendments to EHA have required that a youth's transition from the educational system be considered and planned during the last two years of high school. In this context, educators and policymakers are increasingly seeing the potential benefits of secondary school programs that provide a link to postsecondary education and training.

Recent research suggests that many youth with disabilities are not making the connection to postsecondary education. Fairweather and Shaver (1988) presented preliminary data from the National Longitudinal Transition Study of Special Education Students showing that participation rates of youth with disabilities were considerably lower than those for comparable age cohorts from the High School and Beyond Study (HS&B), which includes mostly youth without disabilities. They reported that fewer than 16% of all youth with disabilities who had been out of secondary school for between 1 and 3 years participated in any kind of postsecondary education, compared to 56% of the HS&B sophomore cohort. In addition, their comparisons showed disparities in the kinds of postsecondary education institutions attended by youth with disabilities and nondisabled youth. Whereas about half of the HS&B youth who participated in postsecondary education took courses from a four-year college, the large majority of youth with disabilities who attended postsecondary institutions took courses from a vocational school or two-year college.

Lower postsecondary participation rates for youth with disabilities, compared with nondisabled youth, are consistent with the findings of other studies. These studies have found that youth with disabilities are less likely to attend college and are more likely to do poorly if they do attend college than nondisabled youth (Astin et al., 1985; Baker and Blanding, 1985; Kirchner and Simon, 1984; Flynn 1982; National Institute of Education, 1980).

Although there is growing evidence showing a discontinuity between secondary and postsecondary education involvement of youth with disabilities, explanations for this discontinuity have been more prescriptive than descriptive and empirical (Greenan, 1985; Stilwell et al., 1983). The National Longitudinal Transition Study of Special Education Students, sponsored by the U.S. Department of Education, provides the first information available nationally about disabled youths' backgrounds, secondary school programs, services received, and postsecondary experiences. SRI International, in conducting the National Longitudinal Transition Study (NLTS), has collected data about more than 8,000 youth who were ages 13-23 and were receiving special education services in the 1985-86 school year.

Data were collected through telephone interviews with parents of these youth, a survey of educators in the schools they attend, and information drawn from the students' secondary school records. (See the appendix for a further description of the National Longitudinal Transition Study of Special Education Students.)

This paper uses the NLTS database to address the question, "What individual characteristics relate to the postsecondary education participation of youth with disabilities?" We present results of a series of logistic regression models that explain the postsecondary education participation of youth with disabilities who recently exited high school, using such factors as youth's background characteristics, abilities and disabilities, students' secondary school achievement and behavior, and community characteristics.

These analyses contribute to efforts to facilitate the transition of youth with disabilities from secondary school to postsecondary education, the workplace, and adult life. They highlight some important features of the relationship between the characteristics of students with disabilities and their postsecondary behavior. Understanding the factors related to success in secondary school and transition to postsecondary education for youth with disabilities may also suggest some features of specific secondary educational services or programs that would be of potential benefit to "at risk" high school students in general.

In the first section of this paper, we briefly describe the postsecondary education participation rates of youth with disabilities. Following this section, we present the methods used in the multivariate analyses and the findings from these analyses. In the final section, we discuss the policy implications of the findings and identify additional research questions that need to be addressed to understand further how youth with disabilities make the transition from secondary to postsecondary education.

Postsecondary Education Participation of Youth with Disabilities

We begin by providing a general picture of postsecondary education participation rates of youth with disabilities who have exited secondary school--"exiters". Students in the National Longitudinal Transition Study exited school during either the 1985-86 or 1986-87 school year by graduating, dropping out, or reaching the school age limit. Their school completion status is based on data drawn from school records and parent reports. The first column in Table 1 shows the postsecondary education participation rates for all exiters with disabilities, as well as their participation rates in three types of postsecondary education institutions: vocational/trade schools, two-year or junior colleges, and four-year colleges or universities. Participation in postsecondary education, as reported by parents, is defined as taking at least one course at a postsecondary education institution in the 12 months prior to data collection.

We hasten to point out that these figures may underestimate actual participation rates. Many individuals included among the exiters had just left secondary school at the time of the interview which was conducted in the Summer of 1987. Some of these may have been planning to go on to postsecondary education in the fall but had not yet done so and were thus counted as nonparticipants. However, participation rates are not significantly higher for youth who had been out of secondary school more than a year than for these recent exiters. The exact status of non-attenders will be clarified as longitudinal follow-up interviews are conducted as part of the National Longitudinal Transition Study. The proportions of youth with disabilities who participated in postsecondary education are presented here largely to acquaint the reader with the data used in these multivariate analyses.

Overall, 15% of youth with disabilities who exited secondary school are reported to have participated in postsecondary education during the year prior to the interview. About 10% of youth with disabilities took at least one course from a vocational or trade school, fewer than 5% took at least one course from a two-year college, and fewer than 2% took at least one course from a four-year college.

Table 1

Postsecondary Education Participation Rates (and Standard Errors) of All Youth with Disabilities*

Postsecondary Education***	Total	Primary Disability Category**										
		Learning Disabled	Emotionally Disturbed	Mentally Retarded	Speech Impaired	Visually Impaired	Hard of Hearing	Deaf	Deaf/ Blind	Orthoped-ically Impaired	Health Impaired	Multiply Handi-capped
Participating in any postsecondary education course in the previous year	15.0% (0.7)	16.0% (1.8)	15.6% (2.2)	8.8% (1.5)	28.7% (3.4)	31.0% (3.0)	26.0% (3.0)	34.9% (2.8)	9.6% (4.9)	19.9% (2.8)	25.3% (3.9)	4.2% (1.7)
Participating in the previous year:												
Vocational courses	10.4 (0.6)	11.1 (1.5)	13.0 (2.1)	8.2 (1.5)	11.1 (2.4)	8.3 (1.8)	9.1 (1.9)	12.6 (1.9)	10.0 (5.0)	6.8 (1.7)	10.2 (2.7)	1.1 (0.9)
Two-year/junior college courses	4.5 (0.4)	4.9 (1.0)	4.5 (1.3)	1.1 (0.6)	15.5 (2.7)	9.3 (1.9)	13.3 (2.3)	14.5 (2.0)	0.0 -	9.1 (2.0)	11.0 (2.8)	2.4 (1.3)
Four-year college courses	1.6 (0.2)	1.6 (0.6)	0.8 (0.5)	0.3 (0.3)	5.2 (1.7)	15.2 (2.4)	4.8 (1.4)	9.5 (1.7)	0.0 -	4.4 (1.4)	6.1 (2.1)	0.0 -
Number of respondents	2437	421	265	339	176	228	217	296	136	208	126	136

* Percentages are weighted; numbers of respondents are unweighted.

** Disability category as identified by students' school district or school.

*** Students may be counted in more than one category if they took courses from more than one type of postsecondary education institution.

Source: Based on parent interviews.

As the remaining columns in Table 1 illustrate, the rate of postsecondary education participation of individuals in the NLTS database varied greatly by disability category. Youth who are deaf or who have a visual impairment had higher rates of participation than youth with other disabilities (35% and 31%, compared to 16% for youth with learning disabilities or emotional disturbances; $p \leq .01$). Youth who are deaf/blind or who have multiple handicaps or mental retardation participate in postsecondary education at the lowest rates (fewer than 10%, fewer than 5%, and fewer than 9%, respectively).

Similarly, examination of the kinds of institutions attended by youths in the NLTS with various types of disabilities also reveals significant differences in postsecondary education participation patterns. Youth with visual impairments were more likely than youth in any other disability category to attend a four-year college (15% compared to fewer than 2% of youth with learning disabilities and fewer than 5% of youth who are hard of hearing, for example; $p \leq .05$). Youth with speech impairments and youth who are hard of hearing or deaf took courses from two-year or junior colleges at higher rates (16%, 13% and 15%, respectively) than youth with other disabilities such as learning disabilities (5%) ($p \leq .05$). Vocational or trade schools were the postsecondary institutions most commonly attended by youth with learning disabilities, emotional disturbances, or mental retardation. For example, vocational schools served 8% of youth with mental retardation, while two- and four-year colleges served fewer than 2% of these youth ($p \leq .01$).

Factors Affecting the Postsecondary Education Participation of Youth With Disabilities

In general, the postsecondary education participation rates of special education students we observed are well below the national norms for nondisabled youth. Are these low participation rates across disability categories a reflection of the ability of these youth to achieve adequately at the secondary level? Is it that they don't graduate; or once graduated,

is it that they do not participate in postsecondary education? What factors affect the transition of these youth from secondary school to postsecondary education? We now turn to a preliminary investigation of the individual student characteristics that are associated with postsecondary participation for youth with disabilities.

Analysis Procedures

The postsecondary participation of special education students in the NLTS is analyzed using logistic regression. A logistic regression model is an appropriate way of assessing the effects of continuous and discrete covariates on a dichotomous outcome variable. For our analyses, the outcome variable is postsecondary participation as reported by parents, and the independent variables include measures of the youth's background, ability and disability, achievement and behaviors, and community characteristics. Each of the variables is discussed in detail below.

The analysis is divided into two parts. First, we estimate the effects of background characteristics, abilities and disabilities, achievement and behavior, and community characteristics separately by disability groups. Postsecondary participation is defined broadly as having enrolled in one or more postsecondary course since leaving high school. Second, we estimate postsecondary participation by type of postsecondary institution using the same set of explanatory variables used in the first set of analyses.

Because postsecondary education participation rates vary so much for youth in each disability category, multivariate analyses are first reported separately for youth in four major disability groups to highlight the differences among disability groups. Analyses are reported for these larger groups, rather than for each of the 11 individual disability categories, because the sample size for many categories is too small for the complex explanatory models developed. Disability groups are defined to maximize the homogeneity of youth within the groups. The first group, referred to as LESI, includes youth who have learning disabilities, emotional disturbances

and/or speech impairments, and who are not also mentally retarded. The second group includes youth with health or orthopedic impairments and not also mentally retarded (referred to as physically impaired). The third group includes youth who are deaf or hard of hearing and not also mentally retarded. The fourth group consists of youth who are visually impaired and not also mentally retarded.

In the second set of analyses, we examine the relationship of individual characteristics to postsecondary participation defined in various ways. Postsecondary participation is defined first as enrollment in any postsecondary institution or program, then separately as participation in four-year or two-year colleges or universities, in four-year colleges or universities, in two-year colleges, and in vocational institutions. The models are estimated for youth from the four disability groups combined, with dummy variables to indicate the individual's disability.*

Logistic regression models are estimated using unweighted data, unlike the descriptive statistics presented thus far. Weighting is appropriate for presenting descriptive statistics in order for them to be generalizable to the national population of youth with disabilities. Thus, for example, one seeks descriptive statistics that indicate the percentage of youths with learning disabilities nationally that attend four-year colleges. However, when estimating multivariate models, weighting is unnecessary since the principal question to be addressed is somewhat different--specifically, for youth in each disability grouping, how are particular variables associated with the likelihood of attending a postsecondary institution? In order to answer this question, there is no reason to assign greater weights to some individuals than to others.

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* We also estimated models testing the significance of interaction terms of a youth's disability category with other variables. These models are not presented here since the interaction terms were not significant and did not improve the fit of the model.

Data on individuals come from the NLTS, which is described in detail earlier in this paper. All youth in the present multivariate analyses were civilians who had exited high school and were not institutionalized at the time of the study. Tables A1-A3 (in the appendix) show means and standard deviations of the unweighted samples used for the multivariate analyses. Table A1 presents statistics for each disability group separately, corresponding to the first set of analyses; Tables A2 and A3 present statistics on the disability groups combined.

The samples analyzed vary somewhat depending upon the definition of postsecondary participation. The subsamples and rationales are as follows:

- For analyses that define postsecondary participation as attending any type of postsecondary institution, the full sample is used.* Thus, enrollment at any type of institution is compared to nonenrollment.
- The analysis that defines postsecondary participation as enrollment in a two- or four-year institution also uses the full sample. In this case, college attendance is the phenomenon of interest, and it is compared to no enrollment at all or enrollment at a vocational institution.
- For the analysis that examines attendance at a four-year institution, we were concerned with who attended *academic* institutions. Individuals who attended a two-year college are excluded from the analysis because whether they were in a vocational or academic program could not be determined.
- Individuals who attended four-year institutions were excluded from the analysis of enrollment in two-year institutions. For this model, what is of interest is who attended a two-year institution as compared to who did not attend any institution or attended a vocational school.
- For the analysis of postsecondary vocational education, no youth who attended any type of college are included. Here we are interested in capturing who attends vocational institutions as opposed to not attending any type of postsecondary institution at all.
- The analysis of two-year vs. four-year institutions includes only youth who were enrolled at either type of institution.

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* The exact number of cases differs somewhat when disability groups are analyzed separately from when they are combined (total N=1,624 for separate disability groups vs. 1,598 for the combined sample). This difference is due to missing data.

Dependent Variables

For these analyses, postsecondary education participation is first defined as a dichotomous variable with a value of one assigned to youth who were reported by parents to have taken at least one course from a postsecondary institution in the 12 months prior to data collection and a value of zero representing no reported attendance at a postsecondary education institution during the same period.

By the first definition employed here, postsecondary participation has the broadest possible meaning, encompassing full- and part-time enrollment in public and private vocational programs, as well as matriculation at two-year or four-year public or private postsecondary institutions, such as community colleges, colleges, or universities. Youth who were institutionalized, incarcerated, or prohibited from attending a postsecondary education institution due to severe illness, disability, or death are excluded from the analysis. In addition, youth with particular disabilities, such as mental retardation or severe impairments, are excluded because of their extremely low level of participation in postsecondary education.

For the next models, postsecondary participation is defined as taking at least one course at a particular type of postsecondary institution: four-year, two-year or vocational. A youth whose parents reported attendance at a four-year institution, for example, is assigned a value of one on the dichotomous dependent variable while all others are assigned a value of zero. Similarly, for participation at a two-year institution, attenders are assigned a value of one; non-attenders, a value of zero.*

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* Recall that most of these analyses are conducted on subsets of the data. See page 9.

Independent Variables

In the analyses presented here, the independent (explanatory) variables measure some student characteristics that have been shown in other studies to be related to postsecondary education participation. In addition, some community context variables are included to control for some aspects of the community that may affect postsecondary participation. The independent variables are described below, and their unweighted means and standard deviations are presented in the appendix.

Characteristics of the Youth

Research on nondisabled youth has demonstrated the effects of several personal and family characteristics on the likelihood of postsecondary education participation. Analyses of High School and Beyond data, for example, indicate that youth from families with higher socioeconomic status (SES) are more likely to attend postsecondary institutions, and that, controlling for SES, females and minorities have higher rates of postsecondary participation. High school grades and test scores were also found to improve youth's chances of pursuing postsecondary education (Hearn, 1988). Do similar relationships hold for youth with disabilities? To test the effects of background characteristics on the chances of postsecondary participation for youth with disabilities, the following variables, measuring using parent report, were included in the analyses:

- Youth's age (in years).
- Youth's gender (1=male; 0=female).
- Youth's ethnic background (1=minority, 0=white).
- Youth's socioeconomic status, measured by:
  - the head of household's educational level (1=no high school diploma, 2=high school graduate, 3=some college education, 4=college degree or more).
  - whether the head of household is employed (1=employed, 0=not employed).
  - whether the youth is from a single parent family (1=one parent family, 0=two parent family).

Ability and Disability

The effects of both ability and disability characteristics of youth on their postsecondary participation were also examined. Two measures of ability are included in the analyses:

- Youth's IQ, as reported by his/her school.
- Youth's functional ability, measured by a scale based on the parent's report of how well youth performs four functional tasks on his/her own, without help: counting change, telling time on a clock with hands, reading common signs, and looking up names in the telephone book and using the telephone. Youth's functional ability on each task was rated from 1 (does the task "not at all well") to 4 (does the task "very well"). Summing the rating on the 4 tasks results in a scale ranging from 4 to 16.

Although the analyses are conducted separately for youth in each disability grouping, within groups there is still considerable variation in the combination and severity of disabilities, which could affect the likelihood of postsecondary participation. Several disability-related variables are included in the analyses to test their direct effects on the probability of postsecondary participation:

- For youth in Group 1, two dichotomous variables are used to control for youth's disability: speech impairment is the youth's primary disability; emotional disturbance is the primary disability.
- For Group 2, physically impaired youth, a dichotomous variable distinguishes individuals who are reported by parents or schools to use a physical aid, such as a wheel chair, crutches, cane, walker, prosthetic, or orthotic, from those who do not. In addition, physical functioning is measured using a scale based on parent's report of how well a youth could perform three basic self-care tasks on his/her own, without help: dress himself/herself, feed himself/herself, and get around to places outside the home, such as a nearby park or neighbor's house. The youth's functional self-care was rated from 1 (does the task "not at all well") to 4 (does the task "very well") on each task. Summing the ratings on the three tasks results in a scale ranging from 3 to 12.
- For Group 3, hearing impaired youth, a dichotomous variable distinguishes youth classified by their school or district as deaf from those who are classified as hard of hearing.

Achievement and Behavior

In addition to the youth's demographic characteristics, abilities, and disabilities, we measured youth's achievement and behavior that may influence postsecondary participation. These variables include:

- Whether the youth graduated from high school, as opposed to dropping out or aging out, as reported by schools and parents. Being a high school graduate may indicate a number of characteristics about an individual. Graduating as opposed to aging-out generally indicates a less severe disability. Logically, too, a diploma is required for what we commonly refer to as college enrollment. Butler-Nalin and Padilla (1989) found that among students with disabilities, graduating as opposed to dropping out tends to be associated with secondary school achievement, experiences, and, for some youth, with academic ability. For these reasons, we were interested to see if we would find more postsecondary participation among high school graduates than nongraduates even though our definition of postsecondary participation is broader than just collegiate education.

- Whether the youth has had disciplinary problems. A dichotomous variable distinguishes youth who were reported by parents to have had one or more of a specific set of disciplinary problems from those who were reported to have had none of them. These disciplinary problems include: ever being fired from a job, leaving school because of suspension or expulsion, or ever being arrested or incarcerated. We hypothesize that having had disciplinary problems decreases youth's likelihood of postsecondary participation.

- Length of time since last attending secondary school. Interviews for the NLTS were conducted during the summer and early fall of 1987. Individuals who were reported by parents to have last attended secondary school in the 1986-87 school year and whose parents were interviewed during the following summer had very little time to attend a postsecondary institution. This control variable is intended to distinguish between youth who had been out of secondary school for more than a year from those who had been out of secondary school for less than a year.

- The degree of social integration of the youth is measured by a dichotomous variable indicating whether the parent reported the youth belonged to any school or community group in the past year. Youth who belonged to groups are expected to be disproportionately represented among those who took postsecondary courses.

Community Environment

We also include two variables which control for characteristics of the community context:

- Urbanicity, measured by two dichotomous variables indicating if the youth attended high school in an urban area or a rural area. The comparison condition is attending school in a suburban area.
- Vitality of the local economy as measured by the Bureau of Labor Statistics' local unemployment rate in 1987. If youth view postsecondary participation as an alternative to employment, when unemployment is high and demand for labor--especially for inexperienced and unskilled labor--is low, relatively many youth may prefer to attend postsecondary institutions.

Findings

Findings from analyses on postsecondary education defined broadly to include participation in vocational schools, two-year colleges, or four-year colleges are presented first. A discussion of the findings on participation in particular kinds of postsecondary education follows.

Participation in Any Postsecondary Education

Table 2 presents the effects of individual and community characteristics on the log odds of participation in any kind of postsecondary education by individuals in four disability groups separately.

Background Characteristics

Postsecondary participation is significantly related to our measure of youth's socioeconomic status in all four of the disability groups analyzed. For the LESI, physically impaired, hearing impaired, and visually impaired groups, postsecondary participation is positively related to head of the

Table 2: Effects of Individual and Contextual Characteristics on the Log Odds of Postsecondary Education Participation of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study by Disability Group

	Disability Group			
	LESI	Physical	Hearing	Visual
Intercept	-8.27***	-11.29**	-8.51***	-1.85
Background Characteristics				
Youth's age	0.15	0.13	0.17	-0.13
Youth is male	0.01	-0.24	-0.45	0.23
Youth is a minority	0.13	0.11	-0.02	0.39
Head of household education	0.26**	0.40**	0.28**	0.34*
Head of household is employed	0.30	-0.02	0.15	-0.17
One-parent household	-0.13	-0.10	0.13	-0.02
Abilities and Disabilities				
IQ	0.00	0.00	0.01	0.01
Functional ability scale	0.15*	0.30*	0.12	-0.02
Speech is primary disability	0.32	-	-	-
ED is primary disability	-0.16	-	-	-
Self-care scale	-	0.13	-	-
Youth uses physical device	-	-0.03	-	-
Youth is a deaf male	-	-	1.03**	-
Youth is a deaf female	-	-	0.09	-
Achievement and Behavior				
Youth is high school graduate	0.71**	1.10*	0.81**	1.42**
Youth has disciplinary problems	-0.13	-0.99	-1.11*	-1.31
Youth belongs to group	0.41*	0.31	0.20	0.87*
Left high school > 12 mos. ago	0.15	0.93*	0.83**	2.26***
Community Characteristics				
Urban Residence	0.34	-0.01	0.03	-0.54
Rural Residence	-0.12	-0.93	-0.39	-0.96
1987 Unemployment rate	-0.01	-0.01	0.00	-0.04
N	757	232	448	187
% Participating in postsecondary education	.22	.28	.35	.33
Chi-Square for L.R. test against model with no variables	71.90***	49.83***	63.82***	59.29***
(df)	(17)	(17)	(17)	(15)

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Source: Based on parent interviews.

household's highest level of education. The higher the educational attainment of youth's head of the household, the greater the likelihood youth in one of those three disability groups participated in postsecondary education. Other aspects of the youth's family situation, whether the head of household was employed and whether the youth came from a single parent family, show no significant relationship to youth's postsecondary participation behavior when other factors in the model are controlled.

Other student background characteristic's included in the model, are not significantly related to the postsecondary participation behavior of youth with disabilities. In the four disability groups analyzed, age, gender and ethnicity are not significantly associated with postsecondary education participation when other factors such as ability and achievement characteristics are controlled.

Ability and Disability

Postsecondary education participation is significantly related to youth's functional ability in the LESI group and the physically impaired group. Youth in these groups who scored higher on the functional ability scale were more likely to have participated in postsecondary education than youth who scored lower on functional ability. Postsecondary education participation as we have defined it here (i.e., including vocational training, not just college attendance) is not significantly related to IQ in any of the disability groups tested. This may be due partially to the fact that youth classified as mentally retarded (a classification that is usually defined by a lower than average IQ) are excluded from the model. More importantly, the very broad definition of postsecondary participation used in this analysis allows for youth with a wide range of disability to participate in postsecondary education.

Our analysis of postsecondary participation using separate disability groups assumes there are differences across disability categories--an assumption supported by the evident differences in postsecondary

participation rates (Table 1). Further controlling for specific disabilities within the four disability groups does not significantly improve the model except for youth in the hearing impaired group. The analysis of the hearing impaired group indicates some gender and disability interaction effects--deaf males were significantly more likely to participate in postsecondary education than were hard of hearing males ($p<.01$). There was no comparable significant difference between deaf females and hard of hearing males or females.

Achievement and Behavior

High school graduation is significantly and positively related to postsecondary participation in all four disability groups. Youth who had graduate from high school were more likely to participate in postsecondary education than youth who had not graduated, (i.e., drop out of high school).

Generally, youth with disabilities who, based on parent reports, experienced disciplinary problems were no less likely to participate in postsecondary education than youth without any reported behavior problems, with the exception of youth in the hearing impaired group. Youth in the hearing impaired group who experienced disciplinary problems were less likely to participate in postsecondary education than youth who did not experience these problems, according to parent report.

Whether youth belonged to a group, a measure of their social integration, is significant in explaining postsecondary participation for youth in the LESI group and the visually impaired group. Belonging to a group is significantly and positively related to postsecondary participation in these two groups.

The length of time since youth last attended high school was also significantly related to postsecondary participation. In three of the groups, the physically impaired, the hearing impaired, and the visually impaired, youth who had been out of school more than a year were more likely

to have enrolled in postsecondary courses than youth who had been out less than a year. The length of time since leaving high school was not significant in the LESI group.

Community Characteristics

Selected characteristics of the community in which the youth attended secondary school are also included in the models to control for contextual factors that may influence postsecondary participation of youth with disabilities. However, as Table 3 shows, neither urbanicity nor the unemployment rate in the community is significantly related to postsecondary participation of the four disability groups analyzed.

Postsecondary Participation for Disability Groups Combined

The results of the logistical regression model estimated for all cases in the four disability groups combined, while controlling for youth's primary disability, are presented in Table 3. In comparing this combined model with the models estimated on the four separate disability groups, we see the same general effects on postsecondary education participation: head of the household's education, youth's high school graduation status, youth belongs to a group, and length of time since high school are significantly related to participation in postsecondary education. In the combined model, youth's functional ability is not significantly related to postsecondary participation (recall that postsecondary vocational courses are included in the broadly defined term of "postsecondary participation" in this study). Youth who are deaf are significantly more likely to participate in postsecondary education than their hard of hearing peers, as are youth in the visually impaired group. No other specific disability-related characteristic was significantly associated with participation in postsecondary education, broadly defined.

Table 3: Effects of Individual and Contextual Characteristics on Log Odds of Postsecondary Education Participation of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study

	Coefficients
Intercept	-8.19***
Background Characteristics	
Youth's age	0.09
Youth is male	0.07
Youth is minority	0.13
Head of household education	0.29***
Head of household is employed	0.16
One-parent household	-0.02
Abilities and Disabilities	
IQ	0.00
Functional ability scale--LESI and physical groups	0.17**
Functional ability scale--hearing and visual groups	0.04
Self-care scale	0.05
Primary disability is speech	0.34
Primary disability is ED	-0.13
Youth in physical group	0.22
Youth uses physical device	-0.25
Youth in hearing group	1.87
Youth is deaf male	0.84**
Youth is deaf female	0.42
Youth in visual group	2.41**
Achievements and Behavior	
Youth is a high school graduate	0.79***
Youth has disciplinary problems	-0.45*
Belongs to a group	0.39**
Left high school > 12 months ago	0.72***
Community Characteristics	
Urban area	0.06
Rural area	-0.38*
1987 unemployment rate	-0.01
N	1,598
% enrolled in postsecondary courses	.28
Chi-Square for L.R. test against model with no variables	219.09***
(df)	(25)

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* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Source: Based on parent interviews.

Participation by Type of Institution

The postsecondary participation of youth with disabilities was also analyzed separately by type of institution attended, and the results are presented in Table 4. Four distinct levels of postsecondary participation are defined: four-year only; four-year or two-year institutions combined; two-year only; and vocational. These analyses were suggested by recent findings that the factors affecting postsecondary participation of youth in the general population varied with changes in the definition of postsecondary participation (Hearn, 1988). The same explanatory model was specified for all definitions of postsecondary participation.

It is evident that collegiate participation is more closely associated with particular individual student characteristics and behaviors than participation in non-collegiate vocational courses or programs. None of the measured individual characteristics, with the exception of two disability-related factors, was associated with participation in postsecondary vocational courses in a non-collegiate setting. Participation at a two-year institution is significantly related to youth's background characteristics (age, head of household's education, and employment status), youth's abilities and disabilities (youth's functional ability, and whether the youth is male and deaf, and whether the youth is classified as visually impaired), and youth's secondary school achievement (high school graduation). Participation of youth with disabilities at four-year institutions show a similar and somewhat stronger relationship to youth's individual characteristics. Participation at four-year institutions was negatively related to youth's minority status (minority students being less likely to participate at a four-year institution than non-minority students), and positively related to youth's head of household education, IQ, high school graduation, belonging to a group and whether the youth is a deaf male. Participation in four-year institutions is also more likely the longer the student has been out of school. (This may be a spurious result due to the timing of the parent survey in relation to the typical admissions cycle for four-year institutions.) In general, we observe a stronger relationship between individual student characteristics, including youth's disabilities, and postsecondary participation as the definition of what constitutes postsecondary is more restrictive.

Table 4: Effects of Individual and Contextual Characteristics on Log Odds of Postsecondary Education Participation of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study by Type of Postsecondary Institution

	Postsecondary Institution			
	4-year or 2-year	4-year	2-year	Vocational
Dependent Variable				
Postsecondary participation	-11.82***	-16.48***	-11.07***	-4.49*
Background Characteristics				
Youth's age	0.11	-0.06	0.15*	0.07
Youth is male	0.06	-0.06	0.08	-0.19
Youth is a minority	-0.12	-0.97**	0.12	0.37
Head of household education	0.38***	0.34***	0.39***	0.10
Head of household is employed	0.37	0.12	0.53*	-0.10
One-parent household	0.18	0.27	0.19	-0.26
Abilities and Disabilities				
IQ	0.01**	0.02**	0.01	-0.01
Functional ability scale--LESI and physical groups	0.18*	0.40	0.13*	0.14*
Functional ability scale--hearing and visual groups	0.01	-0.10	-	-
Self-care scale	0.04	0.07	0.05	0.03
Speech is primary disability	0.62*	1.72	0.46	0.01
ED is primary disability	-0.13	0.16	-0.23	-0.06
Youth in physical group	0.72*	1.52**	0.47	-0.31
Youth uses physical device	-0.11	0.12	-0.17	-0.59
Youth in hearing group	2.88*	8.45*	0.14	-0.25
Youth is deaf male	0.79**	1.07*	0.72*	0.79*
Youth is deaf female	-	-	-	-0.25
Youth in visual group	3.82***	10.25***	0.72*	-0.73
Achievement and Behavior				
Youth is high school graduate	1.17***	2.21***	0.77**	0.15
Youth has disciplinary problems	-0.47	-0.91	-0.26	-0.38
Youth belongs to group	0.46**	0.84**	0.28	0.19
Left high school > 12 mos. ago	1.39***	2.60***	0.96***	-0.33
Community Characteristics				
Urban Residence	-0.00	0.17	-0.05	0.14
Rural Residence	-0.93***	-0.80	-0.99***	0.20
1987 Unemployment rate	0.01	0.03	0.00	-0.02
N	1,598	1,400	1,424	1,232
% Participating in postsecondary education	.18	.07	.13	.12
Chi-Square for L.R. test against model with no variables	324.51***	261.29***	154.51***	42.99**
(df)	(24)	(24)	(23)	(24)

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Source: Based on parent interviews.

The logistic regression model presented in Table 5 highlight the differences between youth with disabilities who attend four-year institutions and those who attend two-year institutions. Youth who are a minority are less likely to attend four-year institutions. Youth who are in the visually-impaired group are more likely to enroll in a four-year institution than at a two-year institution, as are youth who graduate from high school or belong to a group while in high school. Length of time since leaving high school also distinguishes participation in two-year versus four-year, with youth out more than a year more likely to attend a four-year institution.

Discussion

In our examination of the factors affecting postsecondary education participation patterns of these youth, we found that, of the student and family background characteristics measured, only head of the household's education level was consistently associated with postsecondary participation. Age and gender were not significantly related to postsecondary participation; and minority status was only a significant factor in explaining participation in four-year institutions. In general, individual characteristics such as gender, minority status, and age appear to have little relationship to the postsecondary attendance as defined in these analyses when other factors are controlled.

To analyze the postsecondary participation at different types of postsecondary institutions, we used the same logistic regression model as specified earlier to estimate participation at four-year, two-year, vocational, and four- or two-year institutions separately. The obvious similarities in the postsecondary participation models across disability groups, previously reported, lead us to specify a single model for all cases in the four disability groups combined. We controlled for disability group membership by including the appropriate dummy variables in the model.

Table 5: Comparison of Individual Characteristics Related to Participation in Four-year versus Two-year Insitutions for Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study

Dependent Variable Participation in 4-year versus 2-year	
Intercept	-0.36***
Background Characteristics	
Youth's age	-0.21
Youth is male	-0.07
Youth is minority	-1.26**
Head of household education	-0.01
Head of household is employed	-0.53
One-parent household	0.36
Abilities and Disabilities	
IQ	0.01
Functional ability scale	-0.07 *
Self-care scale	0.04
Primary disability is speech	0.98
Primary disability is ED	-0.29
Youth in physical group	0.24
Youth uses physical device	0.75
Youth in hearing group	0.25
Youth is deaf	0.18
Youth in visual group	0.37***
Achievements and Behavior	
Youth is a high school graduate	1.46*
Youth has disciplinary problems	-0.35
Belongs to a group	0.76*
Left high school > 12 months ago	1.29*
Community Characteristics	
Urban area	0.24
Rural area	0.54
1987 unemployment rate	0.01
N	292
% enrolled in postsecondary courses	37
Chi-Square for L.R. test against model with no variables	78.08***
(df)	(23)

* $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

Source: Based on parent reports.

Over all, we observed that individual characteristics, including youth's background characteristics, abilities and disabilities, and school achievement and behavior were associated with participation in two-year and four-year institutions, but not significantly related to participation in postsecondary vocational institutions.

This finding is consistent with recent empirical evidence from studies of the general secondary student population demonstrating that under a broad definition of postsecondary education, the effects of student and family background characteristics on postsecondary participation today may be less strong than research had previously suggested. Hearn (1988), for example, using data from the senior cohort of the High School & Beyond (HS&B) Study, shows that as one broadens the definition of postsecondary education participation from attendance at traditional four-year colleges to attendance at nontraditional as well as traditional institutions, the observable effects of family background factors diminish. These factors are less predictive of participation in any kind of postsecondary education, because postsecondary participation today encompasses a wider variety of educational experiences and settings than it did in the past.

Our analysis of the postsecondary participation of youth with disabilities also examined the effects of youth's educational achievement and behavior. We found postsecondary participation of youth with disabilities to be significantly related to high school graduation. Youth with disabilities who graduate from high school were more likely to participate in postsecondary education than youth with similar disabilities who did not graduate. Thus, even though many nontraditional postsecondary institutions (e.g., many vocational training institutions or two-year colleges) do not require a high school diploma, high school graduation was generally related to postsecondary participation for youth with disabilities.

We found few significant effects of community characteristics on postsecondary education participation for youth with disabilities. We did find postsecondary participation in either four- or two-year institutions to be significantly related to urbanicity (whether the community where the youth

attended high school was an urban, suburban, or rural setting). Youth with disabilities who attended high school in a rural community were less likely to participate in postsecondary education. The research literature suggests that community and secondary school characteristics are related to postsecondary education participation for the general population. The National Longitudinal Transition Study collected information about only a few of many school and community characteristics that may be related to youth's participation in postsecondary education, which may account for the lack of significant relationship between context variables and postsecondary participation we observed in the NLTS data. Further investigation of the relationship of school and community characteristics with postsecondary attendance of youth with disabilities may find other significant results.

In this paper we highlight some effects of variables related to youth's abilities and disabilities on whether they attend postsecondary education. In the group including youth with learning disabilities, emotional disturbances and speech impairments (the LESI group) and in the physically impaired group, youth's functional ability as reported by parents, was positively and significantly related to participation in postsecondary education. In the model that combines disability groups, having a hearing disability categorized as being deaf was significantly and positively associated with postsecondary participation. Youth's IQ, on the other hand, does not appear to be related to participation in postsecondary education, when other factors are controlled in the model.

These analyses point to the need for further research on the factors affecting postsecondary participation of youth with disabilities. As research by Hearn (1988) and others suggests, the inclusion of nontraditional as well as traditional institutions as in our broadest definition of postsecondary education probably masks differences in postsecondary participation patterns for youth with disabilities.

Because postsecondary education today encompasses such a large range of institutions, one important distinction in subsequent studies may be to

distinguish participation by type of institution attended--four-year colleges vs. two-year colleges vs. other kinds of postsecondary institutions, such as vocational schools. We could hypothesize, for example, that youth with disabilities who are from ethnic minority groups probably have lower participation rates at four-year colleges than youth with disabilities who are white, or that youth who are mainstreamed into regular education for more of their academic classes are more likely to attend four-year colleges than youth who are not mainstreamed for academic classes. We were not able to make very detailed comparisons concerning the type and degree of postsecondary participation at this stage of the National Longitudinal Transition Study, because of the relatively low number of youth with disabilities participating in four-year or two-year colleges. Further data collection, when more of the NLTS sample has exited secondary school, will allow for finer distinctions in the dependent variable. In addition, substudies of selected youth will provide more detail on such factors as school program, educational services, and student achievement variables, that may better explain the postsecondary education patterns of youth with disabilities.

This preliminary examination of the postsecondary education participation of youth with disabilities has identified some factors that distinguish nonparticipants from participants. Graduating from high school is clearly one factor that is related to higher rates of postsecondary education participation. To the extent that programs and services help students graduate from high school, they may also contribute to postsecondary education participation. It is clear that more research needs to be done to better understand the low participation rates of youth with disabilities in postsecondary education.

Recent research on the transition of young people in America highlights the serious economic consequences of not participating in further education beyond high school (Grant Foundation, 1988). This research contends that although a small minority of youth who leave high school without graduating, or who graduate but do not pursue additional schooling become economically successful, the majority of young people with only a high school education or

less find it extremely difficult, if not impossible, to sustain even a modest standard of living for themselves and their families. The evidence presented by the Grant Foundation Commission on Work, Family and Citizenship in it's report, "The Forgotten Half: Non-College Youth in America" is striking:

- High school dropouts age 20-24 earned 42% less in 1986 in constant dollars than the same group in 1973.
- Males age 20-24 with high school diplomas earned 28% less in 1986 in constant dollars than a comparable group in 1973.
- A higher proportion of males age 20-24 report being unemployed in 1984 than in 1973--12% compared to 7.3%.
- Since 1985, fewer than half of those employed earn enough to support a family of three above the poverty level.
- The proportion of young people in this age and education category able to find full-time work or going on to postsecondary education full-time has declined--for males from 73% in 1968 to 49% in 1986; for females from 57% to 42%.

In light of this situation for all high school youth in general, particular concern about the transition of youth with disabilities is justified. Youth with disabilities not only have a more difficult time succeeding in high school, but they also encounter more difficulties as they attempt to make meaningful connections in the world of work or independent living. For some youth with disabilities, any degree of functional independence is a major accomplishment. For the majority of youth with disabilities, postsecondary education may be the primary vehicle for providing the necessary skills and education to enable an independent adult life. The social and economic consequences of the discontinuity between secondary and postsecondary opportunities for youth with disabilities deserve serious and immediate public policy attention.

The National Longitudinal Transition Study has amassed a wealth of data on the high school and post-high school experiences of a national sample of youth with disabilities. It is our goal to use these data to inform public policy and educational strategies to create a more effective system of linkages between secondary and postsecondary education to meet the needs of youth with disabilities.

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Appendix

OVERVIEW OF THE NATIONAL LONGITUDINAL TRANSITION STUDY OF SPECIAL EDUCATION STUDENTS

As part of the 1983 amendments to the Education of All Handicapped Children Act (EHA), the Congress requested that the U.S. Department of Education conduct a national longitudinal study of the transition of secondary special education students to determine how they fare in terms of education, employment, and independent living. A 5-year study was mandated, which was to include youth from ages 13 to 21 who were in special education at the time they were selected and who represented all 11 federal disability categories.

In 1984, the Office of Special Education Programs (OSEP) of the U.S. Department of Education contracted with SRI International to determine a design, develop and field test data collection instruments, and select a sample for the National Transition Study. In April 1987, under a separate contract, SRI began the actual study.

Study Components

The National Transition Study has four major components:

- *The Parent/Youth Survey*. In the first year of the study, parents were interviewed by telephone to determine information on family background and expectations for the youth in the sample, characteristics of the youth, experiences with special services, the youth's educational attainment (including postsecondary education), employment experiences, and measures of social integration. This survey is expected to be repeated in 1989, when the youth will be interviewed if he/she is able to respond.

- *School Record Abstracts*. Information has been abstracted from the school records of sample youth for the previous year or for the last year they were in secondary school (either the 1985-86 or 1986-87 school years). Information abstracted from school records relates to courses taken, grades achieved (if in a graded program), placement, related services received from the school, status at the end of the year, attendance, IQ, and experiences with minimum competency testing. Records will be abstracted again in 1989 for youth still in secondary school in the 1988-89 school year.

- *School Program Survey*. Schools attended by sample youth in the 1986-87 school year were surveyed for information on student enrollment, staffing, programs and related services offered secondary special education students, policies affecting special education programs and students, and community resources for the disabled.

- *Explanatory Substudies*. More in-depth studies involving subsamples of the main sample will examine the pattern of transition outcomes achieved by youth who are out of secondary school and the relationship between school experiences and transition outcomes.

Sampling

Youth were selected for the sample through a two-stage sampling procedure. A sample of 450 school districts was randomly selected from the universe of approximately 14,000 school districts serving secondary (grade 7 or above) special education students, which had been stratified by region of the country, a measure of district wealth involving the proportion of students in poverty (Orshansky percentile), and district size (student enrollment).* Because of a low rate of agreement to participate from these districts, a replacement sample of 176 additional districts was selected. In addition, participation in the study was invited from the approximately 80 special schools serving secondary-age deaf, blind, and deaf-blind students. A total of approximately 300 school districts and 25 special schools agreed to have youth selected for the study.

Analysis of the potential bias of the district sample indicates no systematic bias that is likely to have an impact on study results when responding districts were compared to nonrespondents on the types of disabilities served, special education enrollment, participations in Vocational Rehabilitations agency programs, the extent of school-based resources for special education, community resources for the disabled, the configuration of other education agencies serving district students, metropolitan status, percent minority enrollment, grades served, and the age limit for service (see Javitz, 1987 for more information on the LEA bias analysis).

The sample of students was selected from rosters of all special education students ages 13 to 21 who were in grades 7 through 12 or whose birthdays were in 1972 or before. The roster of such students was stratified into 3 age groups (13 to 15, 16 to 18, over 18) for each of the 11 federal handicap categories and youth were randomly selected from each age/condition group so that at least 1,000 students would be selected in each handicap category (with the exception of deaf-blind, a low-incidence condition).

Exhibit A-1 indicates the number of youth sampled in each condition, the proportion for which different combinations of data were obtained, and the reasons for nonresponse for youth for whom data could not be obtained. A study of potential nonresponse bias is now being conducted to determine the representativeness of the youth sample.

Weighting Procedures and Population to Which Data Generalize

Youth with disabilities for whom data could be gathered were weighted to represent the U.S. population of such youth. In performing this weighting, three mutually exclusive groups of sample members were distinguished:

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* The 1983 Quality Education Data, Inc. (QED) database was used to construct the sampling frame. QED is a private nonprofit firm located in Denver, Colorado.

Exhibit A-1

Student Sample by Handicapping Condition

Status	LD	SED	MR	Speech	Ortho	Deaf	H of H	Blind	D/B	Health	Multi	Total
Number of contacts	1650	1321	1642	933	1060	1050	1372	1318	165	1005	1132	12648
No Further Contact Possible												
Unable to locate	59	59	84	50	49	41	70	63	5	33	45	558
Names not provided by LEA	206	271	55	92	18	99	197	120	0	362	212	1632
Deceased	2	0	4	0	11	0	3	2	3	5	2	32
Language barrier/non-Spanish	5	4	5	9	6	12	13	3	0	5	2	64
No respondent exists	23	21	28	18	9	20	11	20	2	9	16	177
Other	3	3	7	5	1	14	6	2	3	5	6	55
Nonworking number	233	178	341	157	146	149	180	193	29	115	94	1815
TOTAL	531	536	524	331	240	335	480	403	42	534	377	4333
(Percentage of total contacts)	32	41	32	35	23	32	35	31	25	53	33	34
Responses												
Completed interview-have consent form	506	326	533	232	388	402	470	475	73	246	362	4013
Completed interview-no consent form	395	258	314	217	216	259	231	255	35	131	159	2460
Total completed interviews	891	584	847	449	604	661	701	730	108	377	521	6473
(% of total contacts)	54	44	52	48	57	63	51	55	65	38	46	51
(% of those to be interviewed)	64	59	57	57	62	73	64	64	69	62	60	62
Have partial data (other sources)	37	43	42	18	35	15	15	20	2	11	24	262
Have partial interview (phone)	39	25	27	25	16	26	17	17	4	19	22	237
Have partial interview (mail)	20	21	49	15	25	23	17	20	4	10	30	234
Total participation	987	673	965	507	680	725	750	787	119	417	597	7206
(% of total contacts)	60	51	59	54	64	69	55	60	72	41	53	57
(% of those to be interviewed)	71	68	64	64	69	80	68	69	75	69	68	69
Refused interview	56	41	40	11	30	19	24	22	3	18	18	282
Refused in earlier contacts	11	3	6	2	20	0	1	3	1	3	9	59
Total refusals	67	44	46	13	50	19	25	25	4	21	27	341
(% of total contacts)	4	3	3	1	5	2	2	2	2	2	2	3
(% of those to be interviewed)	5	4	3	2	5	2	2	2	3	3	3	3
Other	29	20	19	22	8	14	18	18	4	14	22	238

A. Youth whose parents responded to the telephone-administered Parent Interview.

B. Youth whose parents did not respond to the telephone-administered Parent Interview, but were interviewed in the in-person nonrespondent study.

C. Youth whose parents did not respond to either the telephone or in-person Parent Interview, but for whom the school provided a record abstract.

All sample members belong to one of these three groups.

A primary concern in performing the weighting was to determine whether there was a nonresponse bias and to calculate the weights in such a way as to minimize that bias. Nonresponse bias was primarily of three types:*

1. Bias attributable to the inability to locate respondents because they had moved or had nonworking telephone numbers.

2. Bias attributable to refusal to complete a parent interview.

3. Bias attributable to circumstances that made it infeasible for the record abstractors to locate or process a student's record.

Of these three types of nonresponse, the first was believed to be the most important, both in terms of frequency and influence on the descriptive and explanatory analysis. Type 1 bias was also the only type of nonresponse that we could estimate and correct.

We estimated the magnitude of type 1 nonresponse bias by comparing responses on identical (or very similar) items in the three groups of respondents (after adjusting for differences in the frequency with which different handicaps were selected and differences in the size of the LEAs selected). Group A respondents were wealthier, more highly educated, and more likely to be Caucasian than group B respondents. In addition, group A respondents were much more likely to have youth who graduate from high school than group B or C respondents (who had similar dropout rates). On all other measurable items, the youth described by the three groups were similar, including sex, employment status, pay, self-care skills scale, household-care activities scale, functional mental skills scale, association with a social group, and length of time since leaving school. SRI determined that

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* In addition, there was a large group of nonrespondents who could not be located because their LEAs would not provide student names. Presumably, had these student names been available, many of those nonrespondents would have chosen to participate at about the same rate as parents in districts in which youth could be identified. The remaining nonrespondents would presumably have been distributed between the three types of nonresponse mentioned above.

adjusting the weights to eliminate bias in the income distribution would effectively eliminate bias in parental educational attainment and racial composition, but would have a negligible effect on dropout rates. It was also determined that group B and C respondents were present in sufficient numbers that if they were treated as no different from the group A respondents in the weighting process, the resultant dropout distribution would be approximately correct.

Weighting was accomplished using the following sequence of steps:

(1) Data from all three groups were used to estimate the income distribution for each handicapping condition that would have been obtained in the absence of type 1 nonresponse bias.

(2) Respondents from all three groups were combined and weighted up to the universe by handicapping condition. Weights were computed within strata used to select the sample (i.e., LEA size and wealth, and student age).

(3) Weights from four rare handicapping conditions (deaf/blind, deaf, orthopedically impaired, and visually impaired) were adjusted to increase the effective sample size. These adjustments primarily consisted of slightly increasing the weights of students in larger LEAs and decreasing the weights of students in smaller LEAs. Responses before and after these weighting adjustments were nearly identical, except for the deaf/blind. The adjustment for the deaf/blind consisted of removing a single respondent from a medium-sized LEA, who was being weighted up to represent two-thirds of all deaf/blind students. Hence, survey results do not represent deaf/blind students in medium or smaller-sized LEAs.

(4) The resultant weights were adjusted so that each handicapping condition exhibited the appropriate income distribution estimated in step 1 above. These adjustments were of modest magnitude (relative to the range of weights within handicapping condition)--the weights of the poorest respondents were multiplied by a factor of approximately 1.6 and the weights of the wealthiest respondents were multiplied by a factor of approximately 0.7.

Statistical Tests

A statistical procedure was used to compute the approximate standard errors of proportions and to test the difference between two proportions. We first computed the weighted percent of "yes" respondents to a survey item and then computed the effective sample size (i.e., the sum of the weights squared, divided by the sum of the squared weights). These two quantities were then used in the usual formula for the variance of a binomially distributed variable (i.e., pq/n where p is the weighted proportion of "yes" responses, q is the complement of p, and n is the effective sample size). To test the difference of two weighted proportions, we computed the difference between the weighted proportions and divided this quantity by the square root of the sum of the variances of the two proportions.

This procedure is only approximately correct because it adjusts only for the difference in weights, but not for cluster-sampling induced covariance among respondents. We are currently in the process of using pseudo-replication to compute more accurate variance estimates. We expect that the true variances are larger than calculated by the effective sample size method, and therefore that stated significance levels (e.g., $p < .01$) will be somewhat too small. Consequently, we have tended to be very conservative, and for the most part, highlight results that are significant at the .005 level.

Analysis

The first stage of the analysis study involves producing descriptive findings related to individual and family characteristics of youth, their experiences with services, their secondary school program, and their outcomes in terms of education, employment, and independent living. Descriptive questions include the following:

- What are the individual and family characteristics of handicapped youth served under EHA?
- What educational experiences and related services are handicapped youth provided under EHA? How do these vary for youth with different handicapping conditions and of different ages? What is the content, duration, intensity, coordination, and provider of these services?
- What are the characteristics of the schools serving youth with disabilities (e.g., with respect to grade levels served, programs and staff available, policies and practices regarding students with disabilities)?
- What are the achievements of youth with disabilities related to their education (secondary school and postsecondary), employment, and independence? How do these vary for youth with different kinds of disabilities?
- What combinations of services, experiences, and outcomes form transitional life paths for youth with different kinds of disabilities?

The second analysis stage will involve multivariate analyses to determine the relationships among the variables depicted in the conceptual model. Explanatory questions include:

- What factors combine to explain the patterns of services that youth receive?
- What factors explain the educational, employment, and independence outcomes of handicapped youth?
- What explains the paths youth take through secondary school and beyond with respect to services, experiences, and outcomes?

Reporting

Findings of the study will be presented in several forms through several channels. Statistical almanacs will present all the descriptive information available from the study for the total handicapped youth population and for each individual handicapping condition. Dissemination activities will entail conference presentations, journal articles, and mailings of key findings to participants in the study and others interested in its findings. A series of special topic reports will present findings from analyses addressing specific policy or research questions. Four methodology reports will detail the sampling, data collection, and analysis procedures used for the project and the reliability/validity of findings. A final report to OSEP will provide comprehensive documentation of findings.

Table A-1
Means (and Standard Deviations) of Individual and Contextual Characteristics of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study by Disability Group

	Disability Group			
	LESI	Physical	Hearing	Visual
Proportion Employed	0.22	0.28	0.35	0.33
Background Characteristics				
Age	19.50	19.57	20.00	19.55
	(1.42)	(1.68)	(1.52)	(1.37)
Sex (1 = male)	0.74	0.52	0.53	0.59
Minority (1 = minority)	0.27	0.40	0.35	0.40
Head of household education	2.13	2.50	2.27	2.20
	(1.15)	(1.34)	(1.20)	(1.13)
Single parent family	0.32	0.35	0.29	0.35
Head of household is employed	0.78	0.72	0.82	0.75
Abilities and Disabilities				
IQ	93.59	91.94	97.30	99.58
	(13.48)	(16.77)	(13.24)	(14.59)
Functional ability scale	14.74	14.37	14.31	12.68
	(1.99)	(2.66)	(1.97)	(3.28)
Primary disability is speech	0.18	--	--	--
Primary disability is emotional	0.25	--	--	--
Self care scale		10.21		
		(2.51)		
Youth uses physical device		0.45		
Youth is deaf	--	--	0.66	--
Achievement and Behavior				
Youth is high school graduate	0.62	0.72	0.74	0.76
Youth had disciplinary problems	0.29	0.09	0.09	0.05
Belongs to group	0.28	0.32	0.39	0.41
Out of secondary school > 1 yr	0.52	0.50	0.50	0.44
Community Characteristics				
Urban area	0.33	0.57	0.50	0.44
Rural area	0.28	0.10	0.15	0.18
1987 unemployment rate	7.32	7.48	7.08	6.93
	3.09	2.72	2.49	2.05
N	757	232	448	187

Table A-2
Means (and Standard Deviations) of Individual and Contextual Characteristics of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study by Dependent Variable used in Analyses

	Any Psec, 2 or 4 yr	4 Yr Only	2 yr Only	Voc Ed
Proportion in postsecondary	0.19	0.07	0.13	0.12
Background Characteristics				
Age	19.66	19.61	19.73	19.69
	(1.49)	(1.51)	(1.48)	(1.50)
Sex (1 = male)	0.63	0.63	0.64	0.64
Minority (1 = minority)	0.33	0.33	0.34	0.34
Head of household education	2.23	2.16	2.19	2.11
	(1.19)	(1.15)	(1.17)	(1.12)
Single parent family	0.32	0.32	0.32	0.32
Head of household is employed	0.78	0.76	0.78	0.77
Abilities and Disabilities				
IQ	94.99	94.63	94.55	94.10
	(14.27)	(14.23)	(14.15)	(14.06)
Functional ability scale	14.32	14.25	14.34	14.27
	(2.37)	(2.42)	(2.35)	(2.41)
Primary disability is speech	0.08	0.08	0.08	0.08
Primary disability is emotional	0.11	0.12	0.12	0.13
Youth in physical group	0.15	0.14	0.14	0.56
Youth in hearing group	0.28	0.26	0.28	1.31
Youth is deaf	0.18	0.17	0.18	0.17
Youth visual group	0.13	0.12	0.10	0.61
Self care scale	11.52	11.50	11.52	11.50
	(1.34)	(1.38)	(1.35)	(1.40)
Youth uses physical device	0.08	0.08	0.08	0.08
Achievement and Behavior				
Youth is high school graduate	0.68	0.66	0.69	0.67
Youth had disciplinary problems	0.17	0.18	0.17	0.18
Belongs to group	0.33	0.32	0.32	0.31
Out of secondary school > 1 yr	0.50	0.48	0.48	0.46
Community Characteristics				
Urban area	0.42	0.42	0.42	0.42
Rural area	0.21	0.22	0.22	0.23
1987 unemployment rate	7.24	7.28	7.29	7.34
	(2.79)	(2.80)	(2.83)	(2.85)
N	1598	1400	1424	1232

Table A-3
Means (and Standard Deviations) of Individual and Contextual Characteristics of Out-of-School Noninstitutionalized Youth in the National Longitudinal Transition Study who Attended a Two- or Four-Year College in the Year Prior to the Study

Proportion enrolled in four year institution	0.37
Background Characteristics	
Age	19.82
	(1.23)
Sex (1 = male)	0.59
Minority (1 = minority)	0.27
Head of household education	2.82
	(1.35)
Single parent family	0.31
Head of household is employed	0.87
Abilities and Disabilities	
IQ	99.27
	(14.63)
Functional ability scale	14.63
	(2.17)
Primary disability is speech	0.09
Primary disability is emotional	0.04
Youth in physical group	0.17
Youth in hearing group	0.37
Youth is deaf	0.28
Youth in visual group	0.19
Self care scale	11.58
	(1.04)
Uses physical device	0.09
Achievement and Behavior	
Youth is high school graduate	0.86
Youth had disciplinary problems	0.08
Belongs to group	0.47
Out of secondary school > 1 yr	0.69
Community Characteristics	
Urban area	0.44
Rural area	0.10
1987 unemployment rate	6.92
	2.63
N	292